REMARKS

Claim 9 has been canceled.

Independent claims 1 and 24 have been amended to indicate that the present invention provides a motor drive which allows connection to a safety relay, the safety relay operating independently of the other drive circuitry to positively disable the motor drive. Thus, the present invention eliminates the need for complex microprocessor circuitry to be interposed between the safety signals and the control of the motor drive, allowing extremely simple and yet highly reliable disabling of the motor drive.

A new claim 25 has been added indicating that the relay is a conventional electromagnetic relay.

Rejections 35 U.S.C. §103(a)

In light of the present amendments, the rejection of claims 1, 3, 7, 8, 11, 15, and 24 under 35 U.S.C. §103(a) as being unpatentable over Schwesig in view of DeDecker is respectfully traversed.

The present invention is a safety control for an AC motor drive that is intended to eliminate the possibility that the motor could accidentally restart in the event of a computer or logic circuit failure. The invention uses power semiconductors ("high power circuit") controlled by a "logic circuit". A safety relay controls power to a "low power circuit" that normally communicates signals between the "logic circuit" and the "high power circuit". In this way, the safety relay can disable the motor drive even with failure of the "logic circuit".

It is important to note that "safety relay" is a term of art denoting a particular type of relay and is not simply a relay used in a safety capacity. Safety relays have contacts that are mechanically linked together, so that when the relay coil is energized or de-energized, all of the linked contacts move together. In particular, if one set of contacts in the relay becomes welded or otherwise immobilized, no other contact of the same relay will be able to move. This allows monitoring of one contact of the relay to be used to check the status of the relay. Contacts of this type are also sometimes called "forced-guided contacts", "positive-guided contacts", "captive contacts", or "locked contacts". See generally, www.wikepedia.org at "relay". A datasheet for a commercially available safety relay is also provided by way of example.

Schwesig does not show a motor drive using a safety relay to directly controlled or disable the motor drive. Instead, Schwesig uses a redundant microprocessor system (I1 and I2) to disable the motor drive, acting through microprocessor controlled and monitored switches S1 and S2. See, for example, Fig. 1 of Schwesig and the discussion at column 4, lines 10-35.

The present invention provides an advantage over Schwesig in that that the complexity and risk of faults associated with a microprocessor and its software are wholly removed from the safety signal path. Further, the present invention provides a simple and intuitive interface to other safety circuitry that must operate with the motor drive.

Based on these amendments it is believed that the cited reference of DeDecker is no longer applicable, however, the Applicant notes that DeDecker does not teach the use of the safety relay as required by the present claims and further describes a watchdog system that is "built in" to a microprocessor and thus is at risk of being affected by microprocessor faults, just as with Schwesig.

In light of the present amendments, the rejection of claims 4, 6, 13-14 under 35 U.S.C. §103(a) as being unpatentable over Schwesig in view of Rowlette is also respectfully traversed.

It is believed that above described amendments make the cited reference of Rowlette no longer applicable. However, it is noted that generally Rowlette does not teach the use of a safety relay. Applicant cannot confirm that the pull-up resistor cited by the Examiner is on a signal path between low powered circuitry and high-powered circuitry as required by the claims.

New claim 25 describes the use of an electromagnetic relay to remove power from the low powered circuit communicating between the logic circuit and the high powered circuit. It is believed that this claim is allowable for the same reasons described above with respect to the prior art not teaching the use of a safety relay in this capacity.

In light of these amendments and comments, it is respectfully submitted that the use of a safety relay to provide direct control of a sophisticated motor drive system is not fairly taught in the prior art references alone or in combination. Accordingly it is

believed that claims 1, 3-8, 10-17, and 24-25 are now in condition for allowance and allowance is respectfully requested.

Respectfully submitted,

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